APPENDIX C

MEASURES SPECIFICATIONS

DIABETES MEASURES SPECIFICATIONS

Preventive Screening Measures

Measure	**Rate of HbA1C testing**
Rationale	HbA1C tests monitor the degree of blood glucose control during the past three months. Two HbA1C tests annually are recommended for people with diabetes.
Case Definition	HbA1C tests are defined as claims with a CPT code of 83036.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least one claim for an HbA1C test. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD Outpatient SAF 2002 MD Medicare Medical Care Database (physician claims) 2002 MD Home Health SAF
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Measure	**Rate of HbA1C testing (two or more tests)**
Rationale	HbA1C tests monitor the degree of blood glucose control during the past three months. Two HbA1C tests annually are recommended for people with diabetes.
Case Definition	HbA1C tests are defined as claims with a CPT code of 83036.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least two claims for an HbA1C test. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD Outpatient SAF 2002 MD Medicare Medical Care Database (physician claims) 2002 MD Home Health SAF
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Measure	**Rate of Dilated Eye Exam**
Rationale	Dilated Eye exams, which are recommended annually for diabetics provide early identification and treatment of complications related to retinal damage due to diabetes.
Case Definition	Dilated eye examinations are defined as CPT code 67101, 67105, 67107, 67108, 67110, 67112, 67141, 67145, 67208, 67210, 67218, 67227, 67228, 92002, 92004, 92012, 92014, 92018, 92019, 92225, 92226, 92230, 92235, 92240, 92250, or 92260. The following CPT code with provider specialty code 18 or 41 are also included: 90000-90080, 99201-99205, 99211-99215, 90640-90643, 99241-99245.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least one claim for a dilated eye exam. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD Outpatient SAF 2002 MD Medicare Medical Care Database (physician claims) 2002 MD Home Health SAF
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Measure	**Rate of Lipid Profile Testing**
Rationale	A lipid profile is recommended annually for people with diabetes because they are at greater risk for cardiovascular disease.
Case Definition	Lipid profiling is defined as claims with CPT code 80061 or the following three CPT codes on the same day: 82465, 83718, and 84478.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least one claim for a lipid profile. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD Outpatient SAF 2002 MD Medicare Medical Care Database (physician claims) 2002 MD Home Health SAF
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Measure	**Rate of Influenza Vaccination**
Rationale	Annual influenza vaccinations are recommended for people with diabetes because they are at greater risk of complication from influenza.
Case Definition	Influenza vaccinations are defined as claims with CPT code 90657-90660.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least one claim for an influenza vaccination. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD Outpatient SAF 2002 MD Medicare Medical Care Database (physician claims) 2002 MD Home Health SAF
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Measure	**Rate of Pneumococcal Vaccination**
Rationale	Because people with diabetes are at greater risk for developing complications associated with pneumonia, one pneumococcal vaccine dose should be administered to people with diabetes aged 2 to 64 who have never received a dose. At age 65, people with diabetes should receive a one-time revaccination if >5 years have elapsed since the previous dose.
Case Definition	Pneumococcal vaccinations are defined as claims with CPT code of 90732.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least one claim for a pneumococcal vaccination. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD Outpatient SAF 2002 MD Medicare Medical Care Database (physician claims) 2002 MD Home Health SAF
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Measure	**Rate of Microalbuminuria Testing**
Rationale	Microalbuminuria tests detect leakage of protein into the urine, which is an early sign of kidney damage. Annual microalbuminuria tests are recommended for people with diabetes.
Case Definition	Microalbuminuria tests are defined as claims with CPT code 82043 or 82044.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least one claim for a microalbuminuria test. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD Outpatient SAF 2002 MD Medicare Medical Care Database (physician claims) 2002 MD Home Health SAF
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Adverse Outcome Measures

Measure	**Rate of Lower-Limb Amputation**
Rationale	Beneficiaries with diabetes are at higher risk for lower limb amputations. Effective management of diabetes (blood sugar levels, blood pressure, lipid levels, and smoking cessation) and early identification of infections and circulatory complications can reduce the likelihood of hospitalization for limb amputation.
Case Definition	Lower-limb amputations are defined as CPT codes 28800, 28805, 288810, 28820, 28825, 27880, 27881, 27882, 27886, 27888, 27591, 27592, 27594, 27596, 27598 or ICD-9 procedure code 84.10-84.17.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least one claim for a lower limb amputation. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD MedPAR (inpatient claims) 2002 MD Medicare Medical Care Database (physician claims) 2002 MD Home Health SAF
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Measure	**Rate of Hospital Admission for Uncontrolled Diabetes**
Rationale	Uncontrolled diabetes indicates that a diabetic person's blood glucose level is not within acceptable levels. This condition may be caused by non-compliance, dietary indiscretion, or infection. Good access to care and early diagnosis and treatment of diabetes, including control of blood sugar levels and patient education, on an outpatient basis, should lower rates of hospitalization for uncontrolled diabetes.
Case Definition	Uncontrolled diabetes is defined as discharges with a principal ICD-9 diagnosis code of 250.02 or 250.03, without mention of short- or long-term complications.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least one claim for an uncontrolled diabetes hospitalization. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD MedPAR (inpatient claims)
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Measure	**Rate of Hospital Admission for Short-term Complications of Diabetes**
Rationale	Short-term complications of diabetes mellitus include diabetic ketoacidosis, hyperosmolarity, and coma. These complications arise there is an excess of glucose (hyperglycemia) or low blood sugar (hypoglycemia) due to a relative overdosage of blood sugar lowering medication (insulin or oral diabetes medications) in the body. Good access to care and appropriate outpatient treatment and adherence to diabetes care guidelines may reduce the incidence of diabetic short-term complications.
Case Definition	Diabetes short-term complications (ketoacidosis, hyperosmolarity, other coma) are defined as discharges with principal ICD-9 diagnosis codes 250.10-250.13, 250.20-250.23, or 250.30-250.33.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least one claim for a short-term diabetes hospitalization. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD MedPAR (inpatient claims)
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Measure	**Rate of Hospital Admission for Long-term Complications of Diabetes**
Rationale	Effective management of diabetes (control of blood sugar levels) and early identification of complications can reduce the likelihood of worsening conditions that require hospitalizations, such as eye and renal disease and neurological and circulatory disorders.
Case Definition	Diabetes long-term complications are defined as discharges with principal ICD-9 diagnosis codes of 250.40-250.43, 250.50- 250.53, 250.60-250.63, 250.70-250.73, 250.80-250.83, or 250.90-250.93.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with at least one claim for a long-term diabetes hospitalization. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 MD MedPAR (inpatient claims)
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Measure	**Rate of End-Stage Renal Disease**
Rationale	Without proper blood sugar and blood pressure control over time and without monitoring of kidney function, and treatment of early kidney damage, diabetes can lead to kidney disease and failure.
Case Definition	End-stage renal disease (ESRD) is defined as the ESRD indicator variable equal to "yes" on the Medicare Denominator file in 2002.
Population	Main Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, or until date of death, not enrolled in Medicare managed care at any point in the year. Alternative Cohort: Diabetic beneficiaries eligible for Medicare in January 2002, enrolled in Part A and Part B for the full year, not enrolled in Medicare managed care at any point in the year. Beneficiaries with diabetes are identified as those with at least one claim for acute care or at least two claims for nonacute face-to-face care (at least seven days apart) with a diabetes diagnosis (250*, 3572*, 3620*, and 36641). Please refer to Appendix D for a list of acute claims codes, nonacute face-to-face claims codes, and data sources.
Computation	Numerator: Number of eligible beneficiaries with diabetes with ESRD indicator equal to "yes" on the Medicare Denominator file in 2002. Denominator: Number of eligible beneficiaries with diabetes in the population. Rates are expressed per 100 beneficiaries with diabetes.
Data Sources for Numerator	2002 Maryland Medicare Denominator File
Exclusions	Not residing in Maryland as of March 2003 (time of Denominator file creation) Enrolled in managed care at any point in year Evidence of gestational diabetes (indicated by diagnosis code of 6480* or 6488*, where * stands for any code in the fifth position)
Adjustment	Rates are age/sex adjusted using the direct method and the 2002 Maryland Medicare population as the standard population.

Stratifying Variables

All diabetes measures are stratified by the following categories:

Stratifying Variables	**Age** (0-54, 55-64, 65-69, 70-74, 75-79, 80-84, 85-89, 90-94, 95+) **Race** (white, African American, Hispanic, Asian, other) **Sex** **Reason for Medicare eligibility** (aged without ESRD, disabled without ESRD, aged with ESRD, disabled with ESRD, ESRD only). **Dual enrollment** defined as enrolled in Medicare Part A and with Medicaid buy-in at least one month during the calendar year.[1] **County** of the beneficiary's residence in March 2003. [1] The Medicare data do not record true dual enrollment status but only whether a state Medicaid program pays the beneficiary's Medicare premiums, co-pays, and deductibles. The payment of these Medicare expenses by Medicaid does not always translate into full Medicaid coverage. Nevertheless, the buy-in indicator in the Medicare data is a reasonably accurate indicator of beneficiary poverty.